

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

I. Status of Claims

Claims 1-38 are currently pending, among which Claims 1 and 22 are independent. By way of this Amendment and Reply, independent Claims 1 and 22 and dependent Claim 2 have been amended for clarification purposes, and Claim 14 has been amended to address a minor informality. No new matter is added by way of these amendments. Support for the amendments to Claims 1, 2, and 22 can be found, for example, in paragraphs [0036] and [0037] of the published application (Pub. No. 20060257657).

II. Claim Rejections under 35 U.S.C. § 103

A. Claims 1-3, 7-33, and 36-38

On page 2 of the Office Action, the Examiner rejected Claims 1-3, 7-33 and 36-38 as being unpatentable over U.S. Patent No. 6,376,655 (“Berg”) in view of U.S. Patent No. 6,778,316 (“Halas”). By way of this Amendment and Reply, independent Claims 1 and 22 and dependent Claim 2 have been amended. To the extent that the Examiner may still apply the rejection to the claims as amended, this rejection is respectfully traversed.

Independent Claim 1 recites, among other elements, “chromophores having non-linear optical properties attached to **defect sites along bodies of the carbon nanotubes.**” (Emphasis added.) Independent Claim 22, albeit different in scope, has been amended to include a similar feature.

In contrast, Berg and Halas, whether considered separately or in a combination, fail to disclose, teach, or suggest at least the above feature.

On page 2 of the Office Action, the Examiner asserted that Berg discloses chromophores connected to carbon nanotubes via functionalized portions of the nanotubes, which the Examiner considers to be defect sites. Applicant respectfully disagrees.

Specifically, Berg merely teaches that carbon nanotubes can be used as one example of a template to have a DNO oligomer attached thereto (see, e.g., col. 36, lines 49-56). However, Berg is completely silent with respect to “defect sites.” As well known in the art, carbon nanotubes are produced preferably free of defect sites along their bodies. Without proper disclosures on the characteristics of the carbon nanotubes particularly any “defect sites” thereon, or how the carbon nanotubes are treated, or even where on the carbon nanotubes the DNO oligomer is attached, the carbon nanotubes of Berg should be interpreted as free of defect sites. Thus, the DNO oligomer of Berg is likely attached only to the ends of the carbon nanotubes, which are not “defect sites,” or at least not the “defect sites along bodies of the carbon nanotubes” as claimed.

The Examiner also referred to Figs. 49 and 50 of Berg as showing the defect sites of the carbon nanotubes. Applicant respectfully disagrees. Fig. 49 shows cyclic templates (col. 36, line 50), and Fig. 50 shows a specific cyclic template such as calixarenes (col. 36, line 50). Thus, despite of the (misleading) appearance of the circular templates illustrated in Figs. 49 and 50, Berg does not disclose, teach, or suggest DNO oligomers attached to side walls of carbon nanotubes, or to “defect sites along bodies of the carbon nanotubes” as claimed.

Further, as Berg does not have any disclosure on the carbon nanotubes, it should be interpreted in light of what is generally known in the art, i.e., it is likely that the carbon nanotubes’ properties of free of defect sites along their bodies are taken advantage of for the applications as taught by Berg. If the teachings of Berg were modified or combined with other references to have intended or controlled defect sites along the carbon nanotube bodies, the defect sites may attract many unintended molecules, likely rendering the system of Berg being modified unsatisfactory for its intended purpose. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Halas fails to supply what Berg lacks with respect to the feature discussed above. This is also evidenced by the fact that Halas was relied upon in the Office Action merely to

supply a matrix material. Further, as discussed above, there is no reason, motivation, or suggestion to modify the teachings of Berg or to combine Berg with references such as Halas.

Thus, independent Claims 1 and 22 are patentable over Berg and Halas for at least the reasons set forth above. Their respectively associated dependent claims are patentable for at least the same reasons.

Claim 2 depends from Claim 1, and additionally recites, among other elements, that “the defect sites are induced by an acid or an anionic initiator.” Claims 24 and 27 depend from Claim 22. Claim 24 additionally recites “reacting the carbon nanotubes with an initiator,” and Claim 27 recites “reacting the carbon nanotubes with an acid.”

Applicant respectfully submits that Berg and Halas are silent with respect to these additional features. Further, without any proper disclosures on the characteristics of the carbon nanotubes, the nanotubes as taught by Berg and Halas are likely to be defect free. Thus, there is no reason, motivation, or suggestion to treat the carbon nanotubes of Berg and Halas with an acid or an anionic initiator to intentionally induce defect sites. Thus, Claims 2, 24, and 27 are patentable over Berg and Halas for at least these additional reasons.

In view of the above, Applicant respectfully requests withdrawal of the rejection of Claims 1-3, 7-33 and 36-38.

B. Claims 4-6, 34, and 35

On page 5 of the Office Action, the Examiner rejected Claims 4-6, 34, and 35 as being unpatentable over Berg in view of Halas further in view of U.S. Patent No. 6,078,705 (“Neuschäfer”). For at least the following reasons, this rejection is respectfully traversed.

As discussed above, Berg and Halas, even if combined, fail to disclose, teach, or suggest at least one element recited in each of independent Claims 1 and 22. Neuschäfer fail to supply what Berg and Halas lack with respect to the “defect sites along bodies of the carbon nanotubes.” This is evidenced by that Neuschäfer was relied upon in the Office Action merely to supply an organic dye.

Further, as there is no reason, motivation or suggestion to combine Berg with Halas or to modify the teachings therein, there is also no reason, motivation or suggestion to combine these references with Neuschäfer.

Thus, independent Claims 1 and 22 and their respectively associated dependent Claims 4-6, 34, and 35 are patentable for at least the reasons set forth above. Accordingly, Applicant respectfully requests withdrawal of the rejection of Claims 4-6, 34, and 35.

CONCLUSION


Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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